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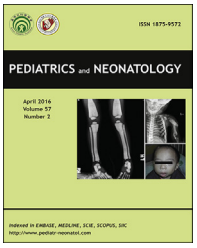

EDITORIAL

Diagnostic Role of B-Type Natriuretic Peptide in Clinical Myocardial Injury Related to Neonatal Asphyxia

Several circulating cardiac biomarkers have gained wide applications in the field of adult and pediatric cardiology, and their roles in identifying cardiac diseases in newborn infants are emerging. Among these biomarkers, B-type natriuretic peptide (BNP) is one of the most frequently utilized indicators of myocardial strain. Because BNP is released into the bloodstream in response to mechanical stress on the ventricular cardiomyocytes, this biomarker may provide insight into the extent of cardiac compromise from various hemodynamic insults in the newborn's heart. Many previous studies have demonstrated elevated circulating BNP levels in newborns with hemodynamically significant patent ductus arteriosus,[1] antenatal stress,[2] and persistent pulmonary hypertension.[3] Studies about the role of BNP in the context of neonatal asphyxia, however, are extremely limited. One previous study by Zhang et al[4] showed that infants with hypoxic–ischemic encephalopathy and myocardial ischemic injury had elevated NT-proBNP levels compared with healthy infants. Perhaps one of the difficulties in conducting studies related to neonatal asphyxia is the limitation in case numbers, as the incidence of perinatal asphyxia is reported to be only 1/1000 live births in resource-rich countries.[5]

In this issue of *Pediatrics and Neonatology*, a study from China investigated the clinical utility of NT-proBNP in a large cohort of patients with neonatal asphyxia.[6] Zhu and Nie[6] included 106 patients with neonatal asphyxia within a 1-year study period, including 46 cases with clinical evidence of myocardial injury. Serum levels of NT-proNP were determined at the age of <3 days and again at the 14^{th} day after admission. In addition, they enrolled 63 cases admitted to the hospital because of mild viral illness or omphalitis at similar age (<3 days) as the control group. The scarcity of both study and control groups and the availability of repeated NT-proBNP data constitute the most unique features of this study. Their result showed that the baseline NT-proBNP level was significantly elevated in clinical evidence of myocardial injury, compared with those without cardiac injury and the control group. Although there is a wide range of normal values of NT-proBNP in the newborn period, the authors provided a cutoff value of 3612.5 pg/mL to distinguish between patients with or without clinical myocardial injury. At follow up, NT-proBNP level dropped significantly in those with myocardial injury at birth, but not in those without myocardial injury and control cases.

Current diagnosis of myocardial injury in newborns with neonatal asphyxia relies on several different clinical criteria. Result from this study provides evidence on the usefulness of serum NT-proBNP level in aiding the diagnosis of myocardial injury related to neonatal asphyxia. Nonetheless, interpretation of these findings should be undertaken with caution. In this study cohort, a high proportion of patients with severe asphyxia had other comorbidities other than myocardial injury, including patent ductus arteriosus and respiratory distress syndrome, which might increase hemodynamic burden on the ventricles and subsequently result in elevated NT-proBNP level. Furthermore, the definition of mild versus severe asphyxia in this study was based on the 1-minute Apgar score, rather than the 5-minute score. Compared with the 1-minute Apgar score, the 5-minute Apgar score is a more useful index of the response to resuscitation, and it has been shown to predict neonatal outcomes.[7] As NT-proBNP level had little discriminative value in terms of the 5-minute score (as the author mentioned in the Discussion section), the question about the prognostic significance of baseline NT-proBNP level remains. Lastly, it is still unknown whether measuring serum NT-proBNP level can guide therapy and improve outcomes in patients with neonatal asphyxia and myocardial injury. Further studies are warranted to address these issues.

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Conflicts of interest

The author declares no conflicts of interest.

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